



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(54) Title: TEAT WASHING MEANS</p> <p>(57) Abstract</p> <p>The present invention concerns a teat washing means for washing udder teats, said means comprising a partly open washing chamber (1) provided with nozzles (4), with a removal conduit (6). As taught by the invention, the open end (2) of the chamber (1) is constituted by a nozzle aperture substantially consistent in size with the cross section of the teat, the nozzles (4) being disposed in its vicinity (4) so that the teats can be inserted in the chamber and withdrawn therefrom one by one.</p>			

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## TEAT WASHING MEANS

The present invention concerns a teat washing means for washing udder teats mechanically.

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Currently, washing of teats of a cow's udder is practiced with fabric towels or in so-called two-phase washing, in which the teats are first washed with disposable towels and thereafter dried. Said washing methods do not always meet the requirements nowadays imposed on cleanliness because the end result of the washing is not necessarily good enough every time. In particular, cleanliness of the teats is of primary importance in view of maintaining in the milk a bacterial flora which enables cheese dairies, for instance, to operate without quality risks.

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In the application print EP 189 954 is disclosed an udder washing means in which a cup-like washing basin is placed around the udder and water is sprayed onto the udder. The means is, however, heavy and cumbersome to use and, in addition, clean water and dirty water become mixed in the washing process because there must be nozzles all around the basin. Hereby the same dirty water is set into rotating movement around the udder in the basin, only part thereof being removed through the removal pipe. Therefore the cleanliness of the udder after the washing is questionable.

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In order to eliminate said problems, the object of the invention is to introduce a novel teat washing means with which uniformity and high standard of the teat washing result are guaranteed, as well convenient and rapid working.

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Regarding the characteristic features of the invention, reference is made to the claims section.

The udder teats washing means of the invention comprises a partly open washing chamber provided with a removal conduit. As taught by the invention, the open end of the chamber is constituted by a mouth aperture dimensioned to conform substantially to the cross section of the teat and in the proximity of which, advantageously inside the aperture, nozzles have been provided. It is thus understood that the teats can be washed, one at a time, by pushing the teat in through the nozzle aperture, that is, applying the chamber around the teat, while at the same time water, or another washing liquid, is jetted against the teat, thus washing it.

Advantageously, the nozzles are also connected to a rinsing water system separate from the washing water system, whereby the teats may first be washed and subsequently rinsed with separate rinsing water. It is also possible to use separate nozzles for the washing and rinsing waters.

Advantageously, the nozzles form at the open end of the chamber a ring encircling the chamber so that the teat will be becomes uniformly washed all over as it passes through the nozzle ring. Although the diameter of the nozzle ring is advantageously close to the teat diameter dimensions, the shape of the chamber itself is subject to no limitations, being determined e.g. by the shape of the body part which is being used.

In an advantageous application of the invention, the means comprises, in conjunction with the washing chamber, rotating brushes adjacent to the nozzles, these brushes as they rotate even further boosting the washing effect. The motor driving the brushes may be an electro-motor located close to them, or the brushes may be rotated e.g. by a motor mounted at a distance and with which the brushes are connected by a rotating wire.

Advantageously, the washing means proper is merely an integral unit fitted with a handle and comprising the above-mentioned washing chamber, in which case to this unit are connected, by flexible tubes, a washing water tank with pump, a rinsing water tank with pump and a used water tank with pump, and a mechanical connection linking the brushes with their drive motor and an electrical connection between the control unit controlling the means and a switch disposed on the unit. Thus, the control unit is advantageously arranged, after receiving a starting signal, to run through a given programme, pumping washing water, and thereafter rinsing water, into the washing chamber, at the same time drawing off used water and, during the washing process, moreover rotating the brushes in a suitable manner.

In an additional application of the invention, the chamber comprises additional nozzles with which air can be blown on the washed and rinsed teat to dry it. It is also possible to use the same nozzles for blowing air which are used in the washing and rinsing steps.

The advantages over prior art which the invention affords include, above all, accurate, uniform and positive washing of the teats, the result of the washing operation depending on a suitable programme, which can be adjusted in the control unit. Considerable saving of time in the washing process and easier work are further advantages.

The invention is described in the following in detail, reference being made to the drawing attached, wherein:-  
Fig. 1 presents a washing means according to the invention, partly sectioned,

Fig. 2 presents part of another washing means according to the invention, and

Fig. 3 presents a washing means arrangement according

to the invention in its entirety.

A washing means according to the invention, depicted in Fig. 1, comprises a cavitary washing chamber 1, which is a space that is open upwards from the unit but otherwise closed. The means is furthermore provided with a handle 17, on which also has been mounted a switch 18 and with the aid of which it is easy to place the means under the udder of a cow and to lift it so that a teat enters the chamber. On the wall of the chamber, close to its open upper end 2, is located an annular nozzle 4, presenting a plurality of nozzle holes uniformly spaced around the chamber. The nozzle is connected both to the washing water system 3 and to the rinsing water system 7, and at the other end 5 of the chamber, at the lower end of the chamber, a removal conduit has been provided, through which the water has been arranged to escape. The chamber 1 is furthermore hinged to break open along the line 21, whereby it can be opened for cleaning whenever needed.

In Fig. 2 is presented an additional application of the means of Fig. 1, in which rotating brushes 8 have been provided in the vicinity of the nozzle 4 and below it. The brushes have been so disposed that their bristles meet in the middle of the chamber, whereby two cylindrical brushes are sufficient to brush the teat uniformly all over as it passes by the brushes.

In Fig. 3 is presented a washing system according to the invention in its entirety. Therein, to the washing means is connected a washing water tank 10 with pump 13, a rinsing water tank 11 with pump 14 and a used water tank 12 with pump 15. To the means is also connected a motor 9 to rotate the brushes. All pumps, the motor and the washing means itself are connected to a control unit 16, which is programmable to carry out the

teat washing in desired manner. In addition, the unit may comprise a storage battery 11 and a battery charger 20, in which case it is not bound to a fixed location and may rather be moved as need be, e.g. along with the 5 milking trolley.

The system of Fig. 3 operates as follows. When a person 10 takes the washing means in his/her hand, he/she pushes it in under the udder so that one teat pushes its way into the washing chamber; and at the same time the switch 18 is pressed, whereby the motor 9 begins to rotate the brushes and the pump 13 pumps washing water from the washing water tank 10 through the nozzles onto the teat. After a preset period of time, the pump 13 15 stops, and possibly also the motor 9, and the pump 14 starts, whereby rinsing water from the rinsing water tank 11 is jetted through the nozzles onto the teat. As soon as the pump 13 has started, the pump 15 also begins to draw off used washing water from the bottom 20 of the washing chamber, and this latter pump is advantageously arranged to operate somewhat longer than the rinsing water pump 14, whereby complete emptying of the chamber on conclusion of the rinsing period is ensured. The control unit 16 is advantageously provided with 25 controls enabling the washing as well as rinsing time to be steplessly regulated; when once in this way the proper time schedule has been empirically found, one may rest assured that the result of washing will be uniform and good always and in all circumstances.

30 The invention has been described in the foregoing in detail, referring to certain advantageous embodiments thereof. However, they are not restrict to the invention, of which the various embodiments may vary within 35 the scope of the inventive idea delimited by the claims.

## CLAIMS

1. A teat washing means for washing udder teats, comprising a partly open washing chamber (1) provided with nozzles (4), with removal conduit (6), characterized in that the open end (2) of the chamber (1) is constituted by a nozzle aperture of a size substantially consistent with the cross section of a teat and in the vicinity of which of which the nozzles (4) have been so disposed that the teats can be pushed into the chamber and withdrawn therefrom one at a time.
2. Washing means according to claim 1, characterized in that the means comprises a rinsing water system (7) connected to the nozzles (4), for rinsing the washed teat.
3. Washing means according to claim 1 or 2, characterized in that the washing chamber (1) is a cavity located in the body of the means, and the nozzles (4) constitute a ring close to the open end (2) and encircling same.
4. Washing means according to any one of claims 1-3, characterized in that the means comprises rotating brushes (8) in the vicinity of the nozzles (4), for washing the teat.
5. Washing means according to any one of claims 1-4, characterized in that the means comprises a motor (9) for rotating the brushes (8).
6. Washing means according to any one of claims 1-5, characterized in that the means comprises a washing water tank (10), a rinsing water tank (11) and a used water tank (12), and respective pumps (13,14,15).

7. Washing means according to any one of claims 1-6, characterized in that the means is connected to a control unit (16) controlling and regulating the various operations of the washing means.

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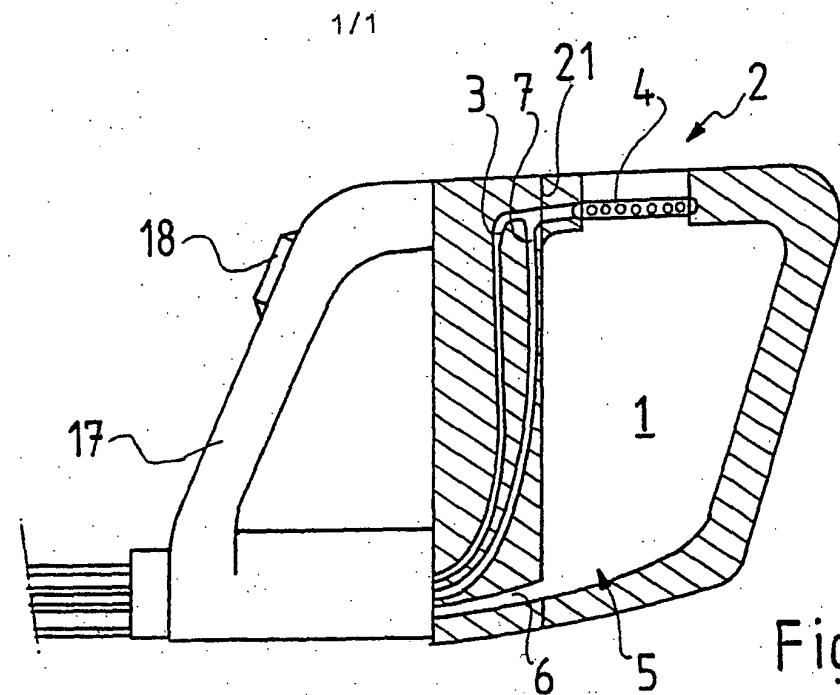


Fig. 1

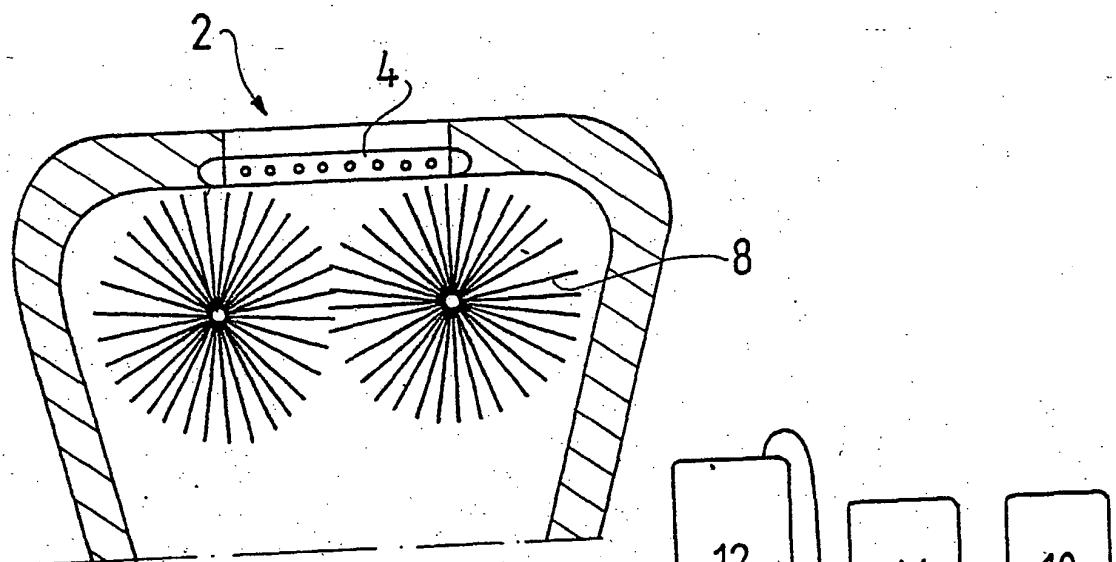


Fig. 2

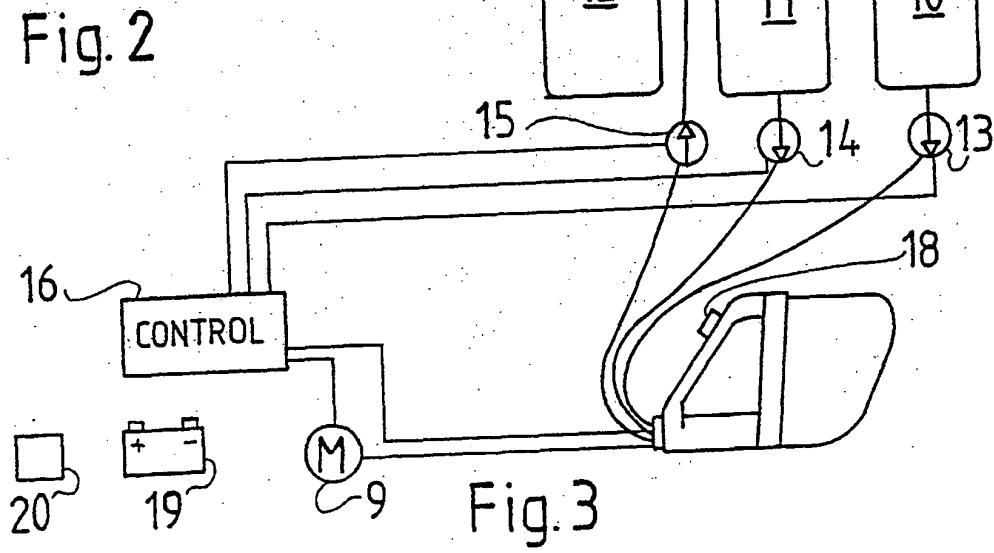


Fig. 3

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/FI88/00110

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) \*

According to International Patent Classification (IPC) or to both National Classification and IPC 4

A 01 K 1/12, 13/00

## II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC 4	A 01 J 1/00; A 01 K 1/00, /12, 13/00
US C1	<u>119</u> : 14.01, 14.03, 14.11, 14.14, 14.18, 14.47, 158

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SE, NO, DK FI classes as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT\*

Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. 13
X	EP. A1, 0 189 954 (C. VAN DER LELY N.V.) 6 August 1986 page 16, line 35 - page 18, line 14; fig 3 & NL, 8500090 NL, 8500089 NL, 8500091	1,2,3,6,7
X	US, A, 4 305 346 (ANDERS V. SPARR SR) 15 December 1981 column 2, line 58 - column 3, line 4; fig 1-3	1,2,3,4
X	FR, A, 2 559 351 (MARQUAIRE P.) 16 August 1985 page 4 line 29 - page 5 line 22; fig 1-3	1,2,3,4,5
		.../...

\* Special categories of cited documents: <sup>10</sup>

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"Z" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search

1988-10-25

Date of Mailing of this International Search Report

1988-11-01

International Searching Authority

Swedish Patent Office

Signature of Authorized Officer

*Catarina Forssén*  
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## III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	EP, A1, 0 207 572 (C. VAN DER LELY N.V.) 7 January 1987 page 7, line 21-25, page 8, line 38 - page 9, line 19; fig 2 & NL, 8501884	1,2,6,7
X	US, A, 4 403 569 (ARTHUR J.R. BENNETT) 13 September 1983 column 3, line 14-24	1,2,3,6,7
X	EP, A2, 0 091 892 (ALFA LAVAL AB) 19 October 1983 page 6, line 1-8	1,7